Check List the journal of biodiversity data

NOTES ON GEOGRAPHIC DISTRIBUTION

Check List 11(6): 1804, 6 December 2015 doi: http://dx.doi.org/10.15560/11.6.1804
ISSN 1809-127X © 2015 Check List and Authors

Lithobates magnaocularis Frost & Bagnara, 1974, the Northwest Mexico Leopard Frog (Anura: Ranidae): new state records for Aguascalientes and Zacatecas, Mexico

Gustavo Ernesto Quintero-Díaz[1, 4], **Edmundo Pérez-Ramos**[2] and **Rubén Alonso Carbajal-Márquez**[3, 4*]

1 Universidad Autónoma de Aguascalientes, Centro de Ciencias Básicas, Departamento de Biología. C. P. 20131, Aguascalientes, Aguascalientes, Mexico
2 Universidad Nacional Autónoma de México, Facultad de Ciencias, Departamento de Biología Evolutiva. Circuitos Investigación Científica y Exterior S/N, Ciudad Universitaria, 04510, México
3 El Colegio de la Frontera Sur. Departamento de Conservación de la Biodiversidad. Unidad Chetumal, Av. Centenario Km 5.5, 77014, Chetumal, Quintana Roo, Mexico
4 Conservación de la Biodiversidad del Centro de México, A. C. Andador Torre de Marfil No. 100, C. P. 20229, Aguascalientes, Aguascalientes, Mexico
* Corresponding Author. E-mail: redman031@hotmail.com

Abstract. We report an adult female and subadult specimen of the frog *Lithobates magnaocularis* Frost & Bagnara, 1974 from tropical deciduous forest habitat in the Municipality of Calvillo, Aguascalientes and Valparaiso, Zacatecas, Mexico. These vouchers represent the first state records of *L. magnaocularis* for Aguascalientes and Zacatecas, and extend the known distribution of the species through the northeastern portion of the tributaries of the Río Grande de Santiago basin.

Key words: Ranidae; Northwest Mexico Leopard Frog; new records

The distribution of *Lithobates magnaocularis* Frost & Bagnara, 1974 extends from east-central Sonora and southwestern Chihuahua, southward to central Jalisco, Mexico, including the states of Durango, Nayarit and Sinaloa, from sea level to 1,628 m (Lemos-Espinal and Smith 2009; Santos-Barrera and Flores-Villela 2010; Rodríguez-Canseco et al. 2013; Enderson et al. 2014; Frost 2015). The species is listed by the IUCN as Least Concern (LC). Despite being endemic to Mexico, *L. magnaocularis* has no conservation status under the Norma Oficial Mexicana (NOM-059-SEMARNAT-2010) (Santos-Barrera and Flores-Villela 2010; Diario Oficial de la Federación 2010). Currently, 20 species of amphibians are documented in Aguascalientes (Vázquez-Díaz and Quintero-Díaz 2005; Quintero-Díaz et al. 2008; Quintero-Díaz et al. 2014; Carbajal-Márquez et al. 2015) and 14 occur in Zacatecas (Parra-Olea et al. 2014). Here, we present data that adds *L. magnaocularis* to the amphibian fauna of both states.

On 27 September 2014, while conducting a field inventory of the Aguascalientes herpetofauna, GEQD and RACM found a lone *L. magnaocularis* in a stream surrounded by tropical deciduous forest in the Municipality of Calvillo Aguascalientes, (21.75552° N, 102.78670° W [WGS84]; 1,700 m above sea level). The specimen was verified by Edmundo Pérez-Ramos and a photo voucher was deposited in the San Diego Natural History Museum, San Diego, California (SDSNH_HerpPC_05287). This frog was an adult female (SVL= 627 mm). This voucher represents the first record of the species for the state of Aguascalientes, and extends the known geographic range ca. 63 km (in a straight line) north-northwest of Temacapulín, Cañadas de Obregón, Jalisco (Rodríguez-Canseco et al. 2013) (Figure 1).

Figure 1. Female specimen of *Lithobates magnaocularis* from Calvillo, Aguascalientes Mexico (SDSNH_HerpPC_05287).

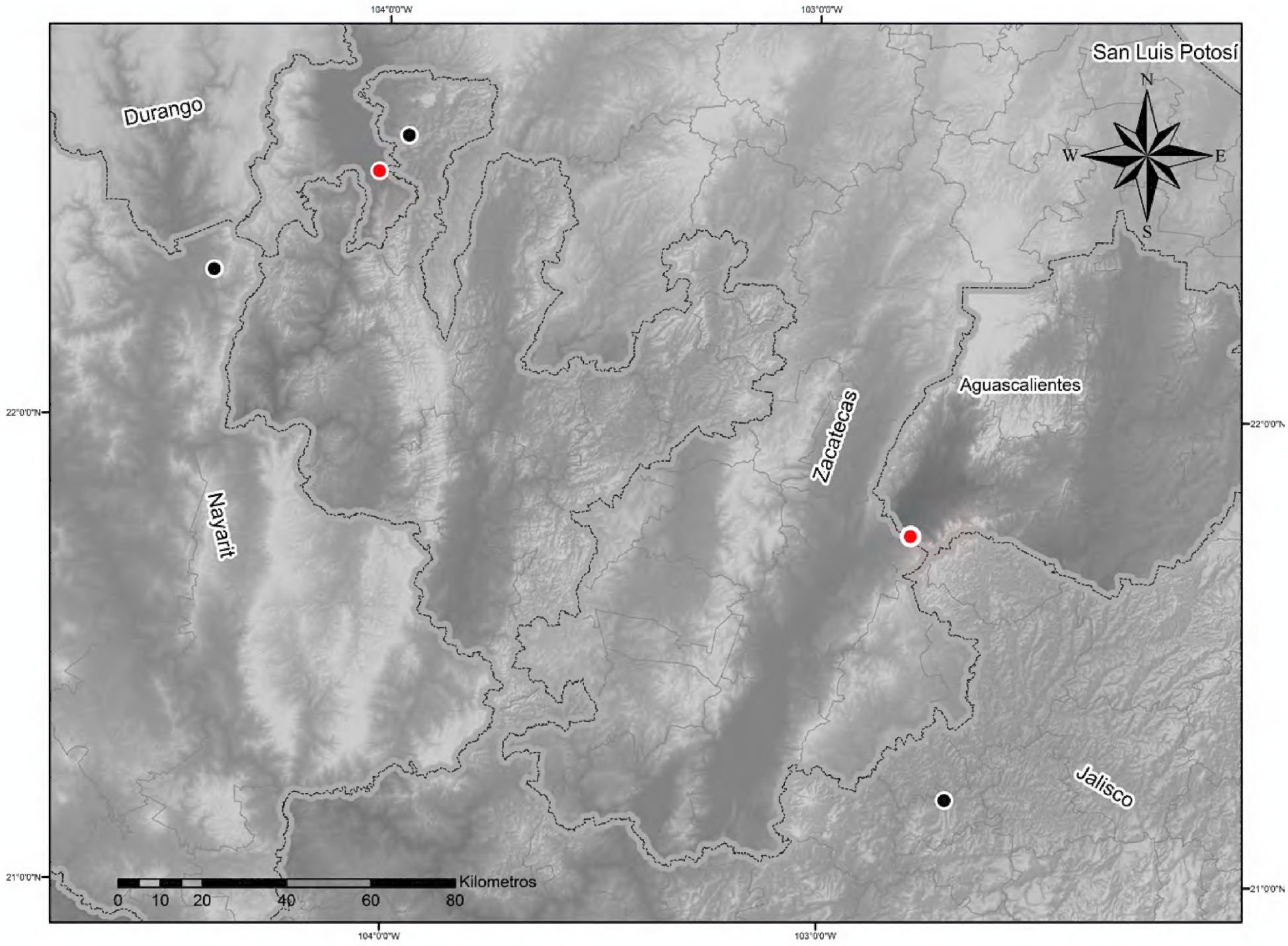

Figure 2. Collecting localities for *Lithobates magnaocularis* across its southeastern geographic range in México; red circle represent new records of *Lithobates magnaocularis* for Aguascalientes at Calvillo and Zacatecas at Valparaiso, respectively; black circles nearest recorded localities at Jalisco and Nayarit.

On 18 October 2014, RACM found another singleton of *L. magnaocularis* in a stream surrounded by tropical deciduous forest at El Zapote in the Municipality of Valparaiso, Zacatecas (22.53188° N, 104.02245° W [WGS84]; 1,115 m above sea level). The specimen was verified by Edmundo Pérez-Ramos and a photo voucher was deposited in the San Diego Natural History Museum, San Diego, California (SDSNH_HerpPC_05288). This frog was a subadult (SVL= 42 mm). This voucher represents the first record of the species for the state of Zacatecas, and extends the known geographic range ca. 11 km (in a straight line) southwest of Huejuquilla El Alto, Jalisco (Carbajal-Márquez et al. 2015), and ca. 50 km northeast of La Vuelta, Del Nayar, Nayarit (McDiarmid 1963) (Figure 2).

The tropical deciduous forest vegetation at both sites was dominated by palo bobo (*Ipomoea intrapilosa, I. murucoides*), zocona (*Bursera bipinnata)*, cuero de indio (*Heliocarpus terebinthinaceus*), tepame (*Acacia pennatula*), huizache (*Acacia farnesiana*), tronadora or galuza (*Tecoma stans*), varaduz (*Eysenhardtia polystachya*), nopal (*Opuntia fuliginosa*), salvia real (*Hyptis albida*) and gatuño (*Mimosa monancistra*) (García-Regalado 2008). Our work was authorized under the permit SEMARNAT SGPA/DGVS/05143/14.

Lithobates magnaocularis is a medium sized frog reaching 56 mm in males, 71 mm in females, total length (SVL). The limbs are short, and are narrowly cross-banded, and the posterior surfaces of the thighs are mottled or spotted. There are no webs on the fingers, but all toes are fully webbed except the fourth. The dorsal surface and upper sides of body are yellowish brown with light edged, rounded, dark brown spots, smaller on sides, 13–34 spots between dorsolateral folds. A dark spot in each eyelid and in about 1/3 there is one on the snout. Display a discontinuous dorsolateral fold at the groin level with the posterior section displaced medially and fragmented. Another ridge extends from above the arm forward under the tympanum to below the orbit. The tympanum is round and about equal in diameter to the orbit-nasal distance, but one-fifth greater than the internarial distance. The skin on the sides is weakly granular, on the dorsum slightly roughened and with small longitudinal ridges. The ventral surface of the head and body are smooth, and the surfaces of the thigh are granular. Males consistently lack vestigial oviducts.

The dorsolateral ridges are nearly white to light brown. The supralabial stripe is incomplete. A dark streak extends from each side of the snout to the corner of the orbit (Frost and Bagnara 1976; Lemos-Espinal and Smith 2009). The only other leopard frog occurring in Aguascalientes and Zacatecas is *Lithobates neovolcanicus* (Hillis & Frost, 1985) (Transverse Volcanic Leopard Frog), which differs from *L. magnaocularis* in having eyes at the size of tympanum, pattern of dark, medium sized spots and associated with evident rough skin and complete supralabial light stripe, in addition to posses large legs; it is further unlike *L. magnaocularis* by having the eyes larger than the tympanum, a pattern of dark, numerous and small spots with dorsal skin relatively smooth, an incomplete supralabial light stripe, and short and robust legs.

Our specimens originate from tributaries in the Río Grande de Santiago basin, a watershed system that forms corridors for tropical biota to disperse upward into highland areas (Baker et al. 1967). In Aguascalientes, this watershed is under heavy pressure from landscape transformation into guava fields, crops and stables. Sousa and Martínez (2010) also mention the occurrence of lead mining in the Río Grande de Santiago basin, with the consequent problem of contamination. These authors also suggest the basin's importance for conservation, due to its high number of endemic species. The basin also encompasses habitats supporting the most inland known localities of several tropical species of herpetofauna (Ahumada-Carrillo and Vázquez-Huizar 2012a, 2012b; Quintero-Díaz et al. 2014; Carbajal-Márquez et al. 2015; Bañuelos-Alamillo et al.2015). Our discoveries of *L. magnaocularis* indicate that additional species typical of the western slope of the Sierra Madre Occidental and Pacific Coastal Plain likely remain to be documented in the upper reaches of the basin, further emphasizing the significance of preserving these riverine corridors.

ACKNOWLEDGEMENTS

We thank Carolina Chávez Floriano, Martín Muñiz Salas, Jorge A. Bañuelos Alamillo, Eric Abdel Rivas Mercado and Marco Antonio Domínguez De la Riva for field assistance.

LITERATURE CITED

Ahumada-Carrillo, I. T. and O. Vázquez-Huizar. 2012a. *Micrurus distans* (West Mexican Coral Snake). Geographic distribution. Herpetological Review 43(1): 106.

Ahumada-Carrillo, I. T. and O. Vázquez-Huizar. 2012b. *Drymarchon melanurus* (Central American Indigo Snake). Geographic distribution. Herpetological Review 43(3): 448.

Baker, R. H., R. G. Webb and P. Dalby. 1967. Notes on reptiles and mammals from southern Zacatecas. The American Midland Naturalist 77: 223–226. doi: 10.2307/2423442

Bañuelos-Alamillo, J. A., R. A. Carbajal-Márquez, G. E. Quintero-Díaz and G. Moreno-Ochoa. 2015. *Trimorphodon paucimaculatus* (Sinaloan Lyresnake). Geographic distribution. Herpetological Review 46(3): 387.

Carbajal-Márquez, R. A., G. E. Quintero-Díaz and E. A. Rivas-Mercado. 2015. *Crotalus basiliscus* (Mexican West Coast Rattlesnake). Geographic distribution. Herpetological Review 46(2): 219.

Carbajal-Márquez, R. A., G. E. Quintero-Díaz and C. Chávez-Floriano.2015. *Ambystoma rosaceum* Taylor, 1941, the Tarahumara Salamander (Caudata: Ambystomatidae), a new state record for Aguascalientes, Mexico. Check List 11(2): 1597. doi: 10.15560/11.2.1597

Carbajal-Márquez, R. A., J. A. Bañuelos-Alamillo, E. A. Rivas-Mercado, G. E. Quintero-Díaz and M. A. Domínguez-De la Riva. 2015. *Lithobates magnaocularis* (Northwest Mexican Leopard Frog). Geographic Distribution. Herpetological Review 46 (3): 379–380.

Diario Oficial de la Federación. 2010. Norma Oficial Mexicana NOM-059-SEMARNAT-2010, Protección ambiental – Especies nativas de México de flora y fauna silvestres – Categorías de riesgo y especificaciones para su inclusión, exclusión o cambio – Lista de especies en riesgo, 30 de diciembre de 2010. http://www.profepa.gob.mx/innovaportal/file/435/1/NOM_059_SEMARNAT_2010.pdf

Enderson, E. F., T. R. Van Devender and R. L. Bezy. 2014. Amphibians and reptiles of Yécora, Sonora and the Madrean Tropical Zone of the Sierra Madre Occidental in northwestern Mexico. Check List 10(4): 913–926. doi: 10.15560/10.4.913

Frost, J. S. and J. T. Bagnara. 1976. A new species of leopard frog (*Rana pipiens* complex) from northwestern Mexico. Copeia 2: 332–338. doi: 10.2307/1443955

Frost, D. R. 2015. Amphibian species of the world: an online reference. Version 6.0. American Museum of Natural History, New York, USA. Accessed at http://research.amnh.org/vz/herpetology/amphibia/ index.html, 30 June 2015.

García-Regalado, G. 2008. Capítulo 3. Biodiversidad. 3. 2. "Selva Baja Caducifolia". pp. 85–88, in: La Biodiversidad en Aguascalientes: Libro de Estado. Comisión Nacional para el Conocimiento y Uso de la Biodiversidad (CONABIO), Instituto del Medio Ambiente del Estado de Aguascalientes (IMAE), Universidad Autónoma de Aguascalientes (UAA). México.

Lemos-Espinal, J. A. and H. M. Smith. 2009. Amphibians and reptiles of the state of Chihuahua, Mexico. Mexico: UNAM, CONABIO, University of Colorado at Boulder. 613 pp.

McDiarmid, R. D. 1963. A collection of reptiles and amphibians from the highland faunal assemblage of western Mexico. Contributions in Science 68: 1–15.

Parra-Olea, G., O. Flores-Villela and C. Mendoza-Almeralla. 2014. Biodiversidad de anfibios en México. Revista Mexicana de Biodiversidad, Suppl. 85: S460–S466. doi: 10.7550/rmb.32027

Quintero-Díaz, G. E., J. Vázquez-Díaz and J. J. Sigala R. 2008. Capítulo 3. Biodiversidad. 3. 15. "Anfibios"; pp. 135 – 139, in: La Biodiversidad en Aguascalientes: Libro de Estado. Comisión Nacional para el Conocimiento y Uso de la Biodiversidad (CONABIO), Instituto del Medio Ambiente del Estado de Aguascalientes (IMAE), Universidad Autónoma de Aguascalientes (UAA). México.

Quintero-Díaz, G. E., C. Chávez-Floriano and R. A. Carbajal-Márquez. 2014. *Craugastor occidentalis* (Taylor's Barking Frog): geographic distribution. Herpetological Review 45(3): 457.

Rodríguez-Canseco, J. M., K. L. González-Estupiñán and L. E. López-Rodríguez. 2013. *Lithobates magnaocularis* (Northwest Mexico Leopard Frog). Geographic distribution. Herpetological Review 44(4): 621.

Santos-Barrera, G. and O. Flores-Villela. 2010. *Lithobates magnaocularis*. The IUCN Red List of threatened species. Version 2015.2. Accessed at http://www.iucnredlist.org, 30 June 2015.

Sousa, M. and E. Martínez. 2010. "Cuenca Alta del Río Santiago, Jalisco, Zacatecas, Nayarit y Durango"; pp. 421–423, in: G.

Ceballos, L. Martínez, A. García, E. Espinoza, J. Bezaury-Creel and R. Dirzo (eds.). Diversidad, amenazas y áreas prioritarias para la conservación de las selvas secas del Pacífico de México. D. F.: Fondo de Cultura Económica, Comisión Nacional para el Conocimiento y Uso de la Biodiversidad.

Vázquez-Díaz, D., J. and G. E. Quintero-Díaz. 2005. Anfibios y reptiles de Aguascalientes. Mexico: CONABIO, Centro de Investigaciones Multidisciplinarios de Aguascalientes. 318 pp.

Author contributions: RACM, GEQD and EPR collected the data, RACM, GEQD and EPR wrote the text. GEQD made the map and took the photographs.

Received: 25 June 2015
Accepted: 7 October 2015
Academic editor: Marcelo Kokubum
Originally published 6 December 2015; revised version published 7 December 2015 correcting the year of publication of *Lithobates magnaocularis* to 1974.